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USER'S GUIDE FOR THE INTERACTIVE SCHEDULING PROGRAM: PRELIMINARY CALENDAR VERSION

Paul J. Downey

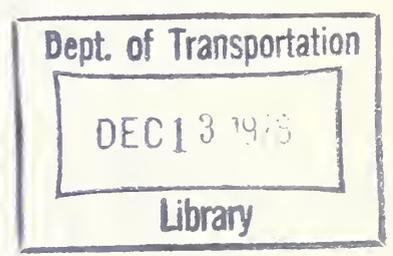
U.S. DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
Transportation Systems Center
Cambridge MA 02142



AUGUST 1978

OPERATIONAL HANDBOOK

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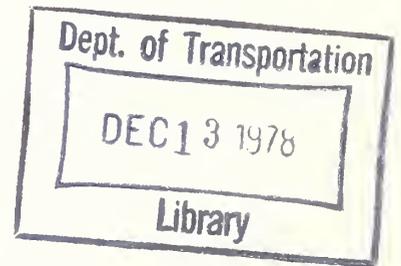
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16. Abstract This document describes the user's guide for the preliminary calendar version of an interactive scheduling program which was developed to aid transit authorities in the scheduling of their warranty maintenance inspections. By utilizing a set of program commands the user is allowed to enter and extract data relative to vehicle warranty scheduling. A scheduling algorithm was developed for this program which incorporates a variable work window whose purpose is to minimize fluctuations in the daily workload. This minimization results in less required manpower and overtime, and, therefore, a reduced maintenance cost. It is anticipated that a version of this program, based on mileage rather than calendar days, will be developed in the near future.					
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PREFACE

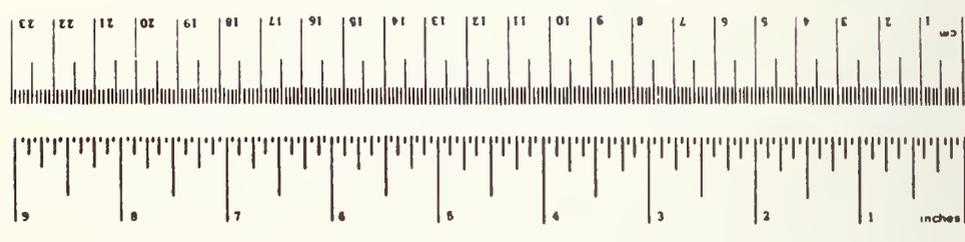
A computerized scheduling system is described that is designed to operate on a real-time or on-line basis. The system schedules regular inspection times that comply with the warranty specifications set forth by the manufacturer. The system schedules maintenance inspections by use of a variable work window which tends to minimize and smooth daily fluctuations in the workload. The program operates on a five consecutive year span for years between 1976 and 2000.

Copies of the program may be obtained by contacting the author at the Transportation Systems Center, Kendall Square, Cambridge MA 02142.

METRIC CONVERSION FACTORS

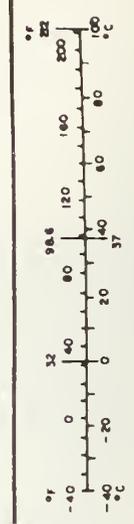
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
sq ft	square inches	6.5	square centimeters	cm ²
sq ft	square feet	0.09	square meters	m ²
sq yd	square yards	0.8	square meters	m ²
sq mi	square miles	2.6	square kilometers	km ²
ac	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tblsp	teaspoons	5	milliliters	ml
fl oz	tablespoons	15	milliliters	ml
c	fluid ounces	30	milliliters	ml
pt	cups	0.24	liters	l
qt	pints	0.47	liters	l
gal	quarts	0.96	liters	l
cu ft	gallons	3.8	liters	l
cu yd	cubic feet	0.03	cubic meters	m ³
	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	sq in
m ²	square meters	1.2	square yards	sq yd
km ²	square kilometers	0.4	square miles	sq mi
ha	hectares (10,000 m ²)	2.5	acres	ac
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	sh ton
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
m ³	cubic meters	0.26	gallons	gal
m ³	cubic meters	36	cubic feet	cu ft
m ³	cubic meters	1.3	cubic yards	cu yd
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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1. PURPOSE

The Office of Transportation Management, Urban Mass Transportation Administration, in conjunction with the Transportation Systems Center, designed and developed the Interactive Scheduling Program (ISP) to assist rail-transit operators in scheduling of preventive maintenance. The ISP was first applied to the scheduling of warranty inspections for the new light-rail vehicles (LRV's) acquired by the Massachusetts Bay Transportation Authority. The warranty for these vehicles covers a 2-year period, and requires scheduled inspections every 45 days. While the ISP is designed for the LRV's, its scope could easily be broadened to aid any property with equipment whose maintenance is conducted on a calendar basis. It is anticipated that a version of this program, based on mileage rather than calendar days, will be developed in the near future.

2. PROGRAM

This program was written in Fortran IV for the DEC-10. It is comprised of routines which access 2 different files. These routines require approximately 30K of core memory. At this time there are eleven operational commands.

3. FILES

3.1 CAR SUMMARY FILE

Entries into the Car Summary File are made interactively through computer conversation. Data is maintained for each vehicle entered, relevant to the car history. Each entry is as follows:

- Car number
- Delivery date
- Car mileage at acceptance
- Initial warranty date
- Warranty expiration date
- Inspection type
- Scheduled inspection date
- Actual inspection date
- Inspection date to be used for scheduling
- Warranty days used
- Next inspection date
- Total mileage.

3.2 CAR SCHEDULE FILE

The Car Schedule File is partially generated from the Car Summary File; the remaining warranty days parameter is computed on a daily basis, and the next inspection date is a projection based on the upcoming inspection date. The data elements are:

- Car number
- Date of inspection
- Type of inspection
- Days since last inspection
- Warranty days remaining
- Date on next inspection.

4. COMMANDS

There are eleven operational commands, seven which either control the program or are used to enter or revise data in the files, and four which retrieve or extrapolate data for specific output requirements. Computation is performed for the most part upon data being input, but some of the output requires projectional calculations based on data existing in the files. After each data input for these commands a "carriage return key" must be "hit".

4.1 DATA INPUT AND PROGRAM CONTROLS

4.1.1 ENTER

A new car is entered into both files by typing ENTER, followed by a return, and then, upon request, the car number. This is followed by a series of questions relating to the warranty and the inspection schedule. (After each data entry, the user hits the return key.) When a successful car entry is made, a car summary print-out is typed.

FORMAT FOR "ENTRY" SUBROUTINE

User types: ENTER	Response: Type car number
User types: XXXX	Response: Type delivery date
User types: MM/DD/YY	Response: Type mileage at acceptance
User types: XXXX	Response: Type initial warranty date
User types: MM/DD/YY	Response: Print of Car Summary for car XXXX

4.1.2 REENT

The REENT command reenters a car into service following an actual inspection, computes the next maintenance cycle and updates the Car Summary File. After typing the command name (followed by a carriage return), a request will be made for a car number. After this input, a series of questions relating to possible entry changes are then asked. This command also prints the resulting Car Summary File for the designated car.

FORMAT FOR "REENT" COMMAND

User types:	REENT	Response:	Type car number
User types:	XXXX	Response:	What was actual date of inspection?
User types:	MM/DD/YY	Response:	From what date would you like to reschedule for the next inspection?
User types:	MM/DD/YY	Response:	Print of Car Summary for car XXXX

4.1.3 UPDATE

The UPDATE command accesses the Car Summary File. The user inputs, following a computer request, the car number. A series of questions, similar to those asked in the ENTER procedure, are posed. A choice of items is printed (upon request) for the user to choose from in selecting which items are to be changed in the file. A series of questions follow concerning that entry. This information replaces that which was previously stored, and can only be changed again by using the UPDATE procedure. When completed, a Car Summary File is printed for the designated car.

FORMAT FOR "UPDATE" COMMAND

User types:	UPDATE	Response:	Type car number
User types:	XXXX	Response:	Do you know the item no. you wish to change? (Y or N)
User types:	N	Response:	Type the item no. you wish to change followed by a coded description of changeable items as follows: 1. Car number 2. Delivery date 3. Mileage at acceptance 4. Initial warranty date 5. Warranty expiration date 6. Inspection cycle data
	or		
User types:	Y	Response:	Type item no.
User types:	1	Response:	Type car number
User types:	XXXX		
	or		
User types:	2	Response:	Type date
User types:	MM/DD/YY		
	or		
User types:	3	Response:	Type XXXX
User types:	X		
	or		
User types:	4	Response:	Type date
User types:	MM/DD/YY		
	or		
User types:	5	Response:	Type date
User types:	MM/DD/YY		
	or		
User types:	6	Response:	Which cycle?
User types:	XXX	Response:	Do you know the item no. you wish to change? (Y or N)
User types:	N	Response:	Type the item you wish to change (followed by a coded listing of items that may be changed): 7. Inspection type 8. Scheduled inspection date 9. Actual inspection date 10. Rescheduled from date 11. Warranty days used 12. Next inspection date 13. Total mileage
	or		
User types:	Y	Response:	Type item no.

User types: 7	Response: Type date
User types: MM/DD/YY or	*Response: Do you wish to make any- more changes in the XX day cycle?(Y or N)
User types: Y or N	Response to Y: Type item number (Reference to Items 7-13)
	Response to N: Do you wish to change any other item?(Y or N)
User types: Y or N	Response to Y: Type item number (Reference to Items 1-6)
	Response to N: Updated Car Summary file for Car XXXX
User types: 8	Response: Type date
User types: MM/DD/YY or	Response: (same as above *)
User types: 9	Response: Type date
User types: MM/DD/YY or	Response: (same as above *)
User types: 10	Response: Type date
User types: MM/DD/YY or	Response: (same as above *)
User types: 11	Response: Type XXXX
User types: XXX or	Response: (same as above *)
User types: 12	Response: Type date
Usertypes: MM/DD/YY or	Response: (same as above *)
User types: 13	Response: Type XXXXXX
User types: XXXXXX	Response: Car Summary File for XXXX

4.1.4 MOD

The MOD command allows the user the opportunity to examine the independent variables used in the scheduling algorithms, and to make necessary changes in them as the need arises. After typing MOD, the user types LIST for a listing of the significant parameters; or CHANGE to change these parameters. In the CHANGE routine, the user first types the number of the item to be changed (all parameters are numerically ordered in the listing), which will be followed

by a series of questions pertaining to that item. All changes will be verified so that, should an input error be made, the item can be corrected.

FORMAT FOR "MOD" COMMAND

User types: MOD	Response:	Do you want to LIST or CHANGE the scheduling data?
User types: LIST	Response:	(List of significant parameters used in scheduling algorithm)
or		
User types: CHANGE	*Response:	Type item number (1-30)
User types: (1-16)	Response:	The XXX-day inspection takes XXX manhours. New number of days for inspection type?
User types: XXX	Response:	New value for number of manhours?
User types: XXX	Response:	The XXX-day inspection takes XXX manhours. Do you want to change the scheduling data?
User types: Y	Response:	(Returns to *)
or		
User types: N	Response:	Do you want the scheduling data listed?
User types: Y	Response:	(List of significant parameters used in scheduling algorithm)
or		
User types: N	Response:	End of execution
or		
User types: 17	Response:	The work window is now plus or minus XX days. New value?
User types: XX	Response:	The work window is now plus or minus XX days. Do you want to change the scheduling data?
User types: Y	Response:	(Returns to *)
or		
User types: N	Response:	Do you want the scheduling data listed?

User types: Y	Response: (List of all significant parameters used in the scheduling algorithm)
or	
User types: N	Response: End of execution
or	
User types: 18-30	Response: Type new date
User types: MM/DD/YY	Response: The holiday is now scheduled for MM/DD/YY. Do you wish to change the base data?
User types: Y	Response: (Return to *)
or	
User types: N	Response: Would you like the base data listed?
User types: Y	Response: (List of significant parameters used in scheduling algorithm)
or	
User types: N	Response: End of execution

4.1.5 DONE

The DONE command terminates the ISP program and closes all open files.

FORMAT FOR "DONE" COMMAND

User types: DONE	Response: End of execution
------------------	----------------------------

4.1.6 DELETE

The DELETE command allows all references regarding any vehicle to be deleted from the files.

FORMAT FOR "DELETE" COMMAND

User types: DELETE	Response: Type car number
User types: XXXX	Response: Car XXXX deleted

4.1.7 DOIT

The DOIT command permits the user to transfer control within ISP to the location where the commands may be listed.

FORMAT FOR "DOIT" COMMAND

User types: DOIT Response: (ISP types message).

4.2 DATA OUTPUT COMMANDS

The data output commands require calculation of present or future inspection scheduling. Of the four data output commands, two project future long-run manpower and maintenance needs, while two print current entries from the two files.

4.2.1 LIST

The command LIST will print the Car Schedule File for a single car or for all cars, and will order the data either by car number or by date. If instead of a car number a carriage return is input, the entire Car Schedule for the full fleet is printed. The LIST command shows at a glance which cars are overdue for inspections and/or which cars have yet to be updated after inspection.

FORMAT FOR "LIST" COMMAND

User types: LIST	Response: For all cars hit the "return" key. For individual cars type car number or a range of car numbers
User types: XXXX or XXXX XXXX	Response: Car schedule file is printed for all cars indicated
or User hits return key:	Response: By car number or by date? (Type car or date)
User types: CAR	Response: Car schedule file for all cars is printed by ascending car number
or User types: DATE	Response: Car schedule file is printed in chronological order.

4.2.2 SUMM

The Car Summary File is obtained by typing SUMM, and then, based on computer conversation, the car number. The Car Summary File for this designated vehicle will then be printed.

FORMAT FOR "SUMM" COMMAND

User types: SUMM	Response: Type car number
User types: XXXX	Response: Car Summary for XXXX

4.2.3 DATE

The DATE command accesses the Car Schedule File, and will print all scheduled maintenance for a single date, or all work between two dates inclusively. The algorithm allows for projections within the range of four inspection

cycles. No work will be scheduled for Saturdays, Sundays, and holidays.

FORMAT FOR "DATE" COMMAND

User types:	DATE	Response:	Type MM/DD
User types:	MM/DD	Response:	Maintenance schedule for MM/DD
	or		
User types:	MM/DD MM/DD	Response:	Maintenance schedule for MM/DD MM/DD

4.2.4 FORE

The command FORE will forecast the weekly manpower requirements for any month within the calendar period covered. In calculating future workloads, the algorithm evenly distributes the work with a five-day tolerance interval, thereby minimizing the daily fluctuations that would arise from a rigid inspection cycle. The forecast, dependent on the Car Schedule Files, will include all cars entered into the ISP.

FORMAT FOR "FORE" COMMAND

User types:	FORE	Response:	Type MM/YY
User types:	MM/YY	Response:	Warranty inspection forecast: MM/YY

APPENDIX

OUTPUT FORMATS

BEFORE YOU GET STARTED, THERE ARE SOME THINGS YOU OUGHT TO KNOW:
LIST NOW HAS DATE OPTION AND CAR RANGE OPTION.
A MOD COMMAND HAS BEEN ADDED.

GOOD MORNING. YOU ARE USING THE MBTA INTERACTIVE SCHEDULING PROGRAM
WHICH IS CURRENTLY SCHEDULING 29 LRU'S FOR WARRANTY INSPECTION.
WOULD YOU LIKE A LISTING OF THE 11 OPERATIONAL COMMANDS?(Y OR N)

Y

THERE ARE 11 OPERATIONAL COMMANDS. THEY ARE:

```
ENTER XXXX
REENT XXXX
UPDATE XXXX
  MOD
  DONE
DELETE XXXX
  DOIT
  LIST XXXX
  -SUMM XXXX
  DATE MM/DD   OR   MM/DD MM/DD
  FORE MM/YY
```

WHERE MM IS A MONTH(1-12)
DD IS A DAY(1-31)
YY IS A YEAR(76-80)
XXXX IS A CAR NUMBER

ENTER

TYPE CAR NUMBER
4241

TYPE THE DELIVERY DATE

TYPE DATE:MM/DD/YY
6/13/77

TYPE THE MILEAGE AT ACCEPTANCE

TYPE XXXXXX
879

TYPE THE INITIAL WARRANTY DATE

TYPE DATE:MM/DD/YY
7/20/77

CAR INSPECTION SUMMARY FILE
CAR 4241

DELIVERY DATE: 6-13-77

MILEAGE AT ACCEPTANCE: 879

INITIAL WARRANTY DATE: 7-20-77

WARRANTY EXPIRATION DATE: 7-10-79

INSPECTION TYPE	SCHEDULED DATE	ACTUAL DATE	RESCHEDULED FROM	WARRANTY DAYS USED	NEXT INSP. DATE	TOTAL MILES
45	9- 2-77	9- 2-77	9- 2-77	44	10-17-77	0

*

REENT

TYPE CAR NUMBER

4241

THE SCHEDULED DATE FOR THE 45 DAY INSPECTION WAS 9- 2-77

WHAT WAS THE ACTUAL INSPECTION DATE?

TYPE DATE:MM/DD/YY

9/3/77

FROM WHAT DATE WOULD YOU LIKE TO RESCHEDULE FOR THE NEXT INSPECTION?

TYPE DATE:MM/DD/YY

9/3/77

TOTAL MILES---TYPE XXXXXX

5431

CAR INSPECTION SUMMARY FILE
CAR 4241

DELIVERY DATE: 6-13-77

MILEAGE AT ACCEPTANCE: 679

INITIAL WARRANTY DATE: 7-20-77

WARRANTY EXPIRATION DATE: 7-10-79

INSPECTION TYPE	SCHEDULED DATE	ACTUAL DATE	RESCHEDULED FROM	WARRANTY DAYS USED	NEXT INSP. DATE	TOTAL MILES
45	9- 2-77	9- 3-77*	9- 3-77	45	10-18-77	5431

*

UPDATE

TYPE CAR NUMBER
4241

DO YOU KNOW THE ITEM NO. YOU WISH TO CHANGE?(Y OR N)
N
TYPE THE ITEM NO. YOU WISH TO CHANGE.

ITEM NO.	DESCRIPTION
1	CAR NUMBER
2	DELIVERY DATE
3	MILEAGE AT ACCEPTANCE
4	INITIAL WARRANTY DATE
5	WARRANTY EXPIRATION DATE
6	INSPECTION CYCLE DATA

TYPE ITEM NUMBER

3
TYPE XXXXXX
679

DO YOU WISH TO CHANGE ANY OTHER ITEM?(Y OR N)
N

CAR INSPECTION SUMMARY FILE
CAR 4241

DELIVERY DATE:	6-13-77	MILEAGE AT ACCEPTANCE:	679			
INITIAL WARRANTY DATE:	7-20-77	WARRANTY EXPIRATION DATE:	7-10-79			
INSPECTION TYPE	SCHEDULED DATE	ACTUAL DATE	RESCHEDULED FROM	WARRANTY DAYS USED	NEXT INSP. DATE	TOTAL MILES
45	9- 2-77	9- 2-77	9- 2-77	44	10-17-77	0

*

MOD

THE SCHEDULER OPERATES ON A 5 YEAR SPAN.
CURRENTLY THE STARTING YEAR IS 1976

DO YOU WISH TO LIST OR CHANGE SCHEDULE DATA?(ANSWER "LIST" ,"CHANGE", OR "NO")
LIST

THE PROGRAM USES THE FOLLOWING SET OF SCHEDULE DATA:

ITEM NUMBER	TYPE MAINTENANCE	MANHOURL REQUIREMENTS
1	45	18
2	90	100
3	135	18
4	180	123
5	225	18
6	270	18
7	315	18
8	360	27
9	405	18
10	450	22
11	495	18
12	540	22
13	585	18
14	630	18
15	675	18
16	720	33

17. THE WORKWINDOW IS NOW PLUS OR MINUS 5 DAYS

THE HOLIDAYS ARE:

	1976	1977	1978	1979	1980
18	1/ 1	1/ 3	1/ 2	1/ 1	1/ 1
19	2/23	2/21	2/20	2/19	2/18
20	4/19	4/18	4/19	4/19	4/18
21	5/31	5/30	5/29	5/28	5/26
22	6/17	6/17	6/19	6/18	6/16
23	7/ 5	7/ 4	7/ 4	7/ 4	7/ 4
24	9/ 6	9/ 5	9/ 4	9/ 3	9/ 1
25	10/11	10/10	10/ 9	10/15	10/13
26	10/25	10/24	10/23	10/22	10/27
27	11/25	11/24	11/23	11/22	11/27
28	12/27	12/26	12/25	12/25	12/25
29	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
30	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0

DO YOU WISH TO LIST OR CHANGE SCHEDULE DATA?(ANSWER "LIST" ,"CHANGE", OR "NO")
NO

DONE

END OF EXECUTION
CPU TIME: 4.79 ELAPSED TIME: 22:51.10
EXIT

DELETE
TYPE CAR NUMBER
3415

CAR 3415 HAS BEEN DELETED

DOIT

GOOD MORNING. YOU ARE USING THE MBTA INTERACTIVE SCHEDULING PROGRAM
WHICH IS CURRENTLY SCHEDULING 29 LRV'S FOR WARRANTY INSPECTION.
WOULD YOU LIKE A LISTING OF THE 11 OPERATIONAL COMMANDS?(Y OR N)

Y

THERE ARE 11 OPERATIONAL COMMANDS. THEY ARE:

ENTER XXXX
REENT XXXX
UPDATE XXXX
MOD
DONE
DELETE XXXX
DOIT
LIST XXXX
SUMM XXXX
DATE MM/DD OR MM/DD MM/DD
FORE MM/YY

WHERE MM IS A MONTH(1-12)
DD IS A DAY(1-31)
YY IS A YEAR(76-80)
XXXX IS A CAR NUMBER

#

MOD

THE SCHEDULER OPERATES ON A 5 YEAR SPAN.
CURRENTLY THE STARTING YEAR IS 1976

DO YOU WISH TO LIST OR CHANGE SCHEDULE DATA?(ANSWER "LIST", "CHANGE", OR "NO")
LIST

THE PROGRAM USES THE FOLLOWING SET OF SCHEDULE DATA:

ITEM NUMBER	TYPE MAINTENANCE	MANHOURL REQUIREMENTS
1	45	18
2	90	100
3	135	18
4	180	123
5	225	18
6	270	18
7	315	18
8	360	27
9	405	18
10	450	22
11	495	18
12	540	22
13	585	18
14	630	18
15	675	18
16	720	33

17. THE WORKWINDOW IS NOW PLUS OR MINUS 5 DAYS

THE HOLIDAYS ARE:

	1976	1977	1978	1979	1980
18	1/ 1	1/ 3	1/ 2	1/ 1	1/ 1
19	2/23	2/21	2/20	2/19	2/18
20	4/19	4/18	4/19	4/19	4/18
21	5/31	5/30	5/29	5/28	5/26
22	6/17	6/17	6/19	6/18	6/16
23	7/ 5	7/ 4	7/ 4	7/ 4	7/ 4
24	9/ 6	9/ 5	9/ 4	9/ 3	9/ 1
25	10/11	10/10	10/ 9	10/15	10/13
26	10/25	10/24	10/23	10/22	10/27
27	11/25	11/24	11/23	11/22	11/27
28	12/27	12/26	12/25	12/25	12/25
29	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
30	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0

DO YOU WISH TO LIST OR CHANGE SCHEDULE DATA?(ANSWER "LIST", "CHANGE", OR "NO")
NO

DONE

END OF EXECUTION
CPU TIME: 4.79 ELAPSED TIME: 22:51.10
EXIT

DELETE
TYPE CAR NUMBER
3415

CAR 3415 HAS BEEN DELETED

DOIT

GOOD MORNING. YOU ARE USING THE MBTA INTERACTIVE SCHEDULING PROGRAM
WHICH IS CURRENTLY SCHEDULING 29 LRU'S FOR WARRANTY INSPECTION.
WOULD YOU LIKE A LISTING OF THE 11 OPERATIONAL COMMANDS?(Y OR N)

Y

THERE ARE 11 OPERATIONAL COMMANDS. THEY ARE:

ENTER XXXX
REENT XXXX
UPDATE XXXX
MOD
DONE
DELETE XXXX
DOIT
LIST XXXX
SUMM XXXX
DATE MM/DD OR MM/DD MM/DD
FORE MM/YY

WHERE MM IS A MONTH(1-12)
DD IS A DAY(1-31)
YY IS A YEAR(76-80)
XXXX IS A CAR NUMBER

*

LIST

FOR ALL CARS, HIT THE "RETURN" KEY
 FOR 1 OR MORE CARS, TYPE CAR NUMBER OR A RANGE OF CAR NUMBERS.

BY CAR NO. OR BY DATE?(TYPE CAR OR DATE)

CAR

CAR SCHEDULE FILE (7-21-77)

CAR NO.	INSP DATE	INSPECTION TYPE/AT	DAYS SINCE LAST INSP	WARRANTY DAYS USED/REMAIN	NEXT INSP
3403	6- 5-77\$	90 88	45	132 588	7-21-77
3405	7-12-77	90 90	46	99 621	8-24-77
3406	6-30-77	135 170	58	187 533	8-15-77
3407	7- 6-77	135 166	50	181 539	8-19-77
3408	8- 9-77	90 91	47	72 648	9-22-77
3409	7-20-77	90 96	49	97 623	8-31-77
3410	6-15-77	90 89	43	125 595	7-28-77
3411	8-17-77	90 83	40	56 664	9-30-77
3415	5-26-77	135 147	50	203 517	7-11-77
3416	6- 3-77	135 155	52	203 517	7-18-77
3418	7- 7-77	180 189	51	203 517	8-23-77
3419	7-25-77	135 136	45	132 588	9- 8-77
3420	6-29-77	180 181	48	203 517	8-12-77
3421	5-24-77	90 127	83	189 531	7- 8-77
3422	5-26-77	90 90	41	146 574	7-13-77
3423	6-11-77\$	135 152	53	189 531	7-26-77
3424	6-17-77\$	135 151	52	182 538	8- 2-77
3425	6- 1-77	90 89	45	139 581	7-19-77
3426	6-28-77	135 151	49	174 546	8-10-77
3427	8- 1-77	90 117	70	106 614	9-16-77
3428	5-30-77\$	90 90	41	142 578	7-14-77
3429	7-22-77	135 130	40	129 591	9- 7-77
3430	5-30-77\$	90 90	43	142 578	7-15-77
3431	6-15-77	90 90	45	126 594	7-29-77
3432	6-22-77	90 90	50	119 601	8- 5-77
3433	8-11-77	90 90	45	69 651	9-27-77
3434	7-27-77	90 86	43	80 640	9-14-77
3438	8- 4-77	90 92	45	78 642	9-20-77
3464	8-18-77	90 86	44	58 662	10- 4-77

*

DATE

TYPE MONTH AND DAY: (MM/DD)

7/28

LRV WARRANTY MAINTENANCE SCHEDULE

DATE	CAR NO.	TYPE INSPECTION	MANHRS	DAYS SINCE LAST INSPECTION
7-28-77	3410	135	18	43
			TOTAL 18	

*

DATE

TYPE MONTH AND DAY: (MM/DD)

7/18 7/29

LRV WARRANTY MAINTENANCE SCHEDULE

DATE	CAR NO.	TYPE INSPECTION	MANHRS	DAYS SINCE LAST INSPECTION
7-18-77	3416	180	18	45
			TOTAL 18	
7-19-77	3425	135	18	48
			TOTAL 18	
7-20-77	3409	90	100	49
			TOTAL 100	
7-21-77	3403	135	18	46
			TOTAL 18	
7-22-77	3429	135	18	40
			TOTAL 18	
7-25-77	3419	135	18	45
			TOTAL 18	
7-26-77	3423	180	18	45
			TOTAL 18	
7-27-77	3434	90	100	43
			TOTAL 100	
7-28-77	3410	135	18	43
			TOTAL 18	
7-29-77	3431	135	18	44
			TOTAL 18	

*

*

SUMM

TYPE CAR NUMBER
3428

CAR INSPECTION SUMMARY FILE
CAR 3428

DELIVERY DATE: 10-12-76

MILEAGE AT ACCEPTANCE: 1063

INITIAL WARRANTY DATE: 12-30-76

WARRANTY EXPIRATION DATE: 12-30-78

INSPECTION TYPE	SCHEDULED DATE	ACTUAL DATE	RESCHEDULED FROM	WARRANTY DAYS USED	NEXT INSP. DATE	TOTAL MILES
45	2-12-77*	2-10-77	2-10-77	43	3-29-77	4247
90	3-27-77*	3-29-77	4- 1-77	92	5-16-77	8283
135	5-16-77	5-12-77	5-16-77	133	6-29-77	12673

*

FORE

TYPE MONTH AND YEAR: (MM/YY)
7/77

WARRANTY INSPECTION FORECAST

WEEK	JULY 1977					TOTAL
	1	2	3	4	5	
MANHOURS	0	136	172	90	254	652

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